REMARKS

The title has been amended to more accurately title the application.

Claim 1 was amended to provide that the evaluation steps at the end of the claim are preformed by a "computer inputting, calculation and display system". Support for this language is provided by Fig. 2 and the written description thereof. Claim 1 was further amended to remove any possible misunderstanding of the last step of the evaluation (suggested by the Examiner).

The Examiner has rejected claims 1-4 and 6 under 35 U.S.C. § 101. Reconsideration of these claims as independent claim 1 has now been amended to make clear that the evaluation steps are practiced using a computer inputting, calculation and display system. This method cannot be practiced with pencil, paper, and a calculator.

The claims now satisfy the "machine or transformation test" acknowledged as one possible test for a new and useful process that is not so abstract as to be deemed unpatentable subject matter. Moreover, the claimed methods are not merely directed to a mathematical formula but to a useful evaluation method for determining whether replacement of steam traps in a steam piping system is justified by the cost savings due to the reduced loss of steam. A real world problem has been solved. The methods claimed are not abstract but very particular and specific. Each of the steps set forth are particular. "Abstract" means "disassociated from a particular instance." The methods of the claims are not disassociated but directed to particular instances. In no way do the claims preempt all methods of evaluating the justification for replacing steam traps in a steam piping system as would be the case if the claim set forth abstract methods.

The Examiner has rejected claims 1-4 and 6-9 under 35 U.S.C. § 103(a) as being unpatentable over Fujiwara U.S. Patent Publication No. 2002/0052716 (hereinafter Fujiwara Publication '716). Reconsideration is requested.

The Fujiwara Publication '716 is directed to a particular but different method of determining the desirability of replacing steam traps. The Examiner appears to acknowledge that the Fujiwara Publication '716 does not teach the step of:

> determining a total receiving steam amount (Qi) which is a
> total amount of steam supplied to an evaluation target steam piping and a
> total necessary steam amount (Qo) which is a total amount of steam

required by a steam-using device in the evaluation target steam piping or determining a difference between said total receiving steam amount and said total necessary steam amount as a total unknown steam amount ($Qx = Qi - Qo$) which is a total steam loss amount in the evaluation target steam piping

Rather, the Fujiwara Publication '716 teaches first determining the steam loss due to malfunction of each individual steam trap and aggregating at paragraph [0014]. The Examiner assumes that these are the same. They are not. The Fujiwara Publication '716 first requires a laborious physical task of determining the degree of malfunctioning of each steam trap in the system. Applicant's method does not involve initial testing of each trap. The step in Applicant's method for determining total unknown steam loss amount does not involve testing each steam trap and aggregating the results. Moreover, the information gathered is not the same. Applicant has already pointed out this key difference, but the Examiner has attempted to dismiss it asserting incorrectly that the Applicant's claims and specification do not offer options for "other steam losses." Therefore, the Examiner has assumed Applicant's ($Qx = Qi - Qo$) is the same as the aggregated loss due to malfunctioning of steam traps. Patents are written for those of ordinary skill in the art. Those of ordinary skill in the art would not conclude that the only unintended losses in a steam piping system are those due to malfunctioning steam traps. The Applicant's specification could not make this clearer.

That is to say, in a steam piping, in general, there exists steam loss due to <u>various</u> causes. In the system diagnosing method according to this first characterizing feature, the total unknown steam amount (Qx) which is a difference between the total receiving steam amount (Qi) and the total necessary steam amount (Qo) means a total amount of steam loss existing due to various causes in an evaluation target steam piping. (page 3 ll. 18 – 23) [emphasis added]

Namely, a value Qx (=$Qi-Qo$) obtained by subtracting the total necessary steam amount Qo from the total receiving steam amount Qi means a total amount of steam qx1 through qx4 (unknown steam amount) lost in <u>some manner</u> in the target system 1. (page 33 ll. 12 – 15) [emphasis added]

As the steam loss existing due to various causes in the steam piping, there can be chiefly mentioned steam leakage in the steam trap, steam leakage in the steam piping, and steam condensation in the steam piping.

Filed herewith is page 1550 of the McGraw–Hill Dictionary of Scientific and Technical Terms, Third Edition (1984) with the following definition of a steam trap: "A device which drains and removes condensate automatically from steam lines."

Also attached is a recent article in Wikipedia, in which there is a similar description reading:

> A steam trap is a device used to discharge condensate and non condensable gases with a negligible consumption or loss of live steam. Most steam traps are nothing more than automatic valves. They open, close or modulate automatically. Others, like venturi traps, are based on turbulent 2-phase flows to obstruct the steam flow.

As described above, in the steam piping equipped with the steam trap, steam condensation is generated, and the condensed water is separated from the steam and discharged from the steam piping, by the steam trap. This is common technical knowledge.

This steam condensation becomes a part of the difference between the total receiving steam amount Qi and the total necessary steam amount Qo. Therefore, this steam condensation is a part of the steam loss existing due to various causes in the steam piping, and this a part of the total unknown steam amount Qx, as referred to in the present invention.

Furthermore, in the specification of the present invention, there is a description reading:

> Moreover, in the implementing the system diagnosing method according to the first characterizing feature, in case the flash steam generated from high-pressure steam drain is to be reused in the low-pressure system, it is preferred that the total receiving steam amount be grasped with the amount of the reused flash steam being included in duplication in the amount of steam prior to the draining. (page 5 ll. 9-14)

This description also indicates that the steam condensation exists in the steam piping to which the present invention is directed.

When the flash steam generated from high-pressure steam drain is not reused, the high-pressure steam drain (condensed water) becomes a part of the steam loss (total unknown

steam amount Qx), and it can be understood that the low-pressure steam drain generated in the low-pressure system of the steam piping also becomes a part of the steam loss (total unknown steam amount Qx).

The attached diagrams in Figs. A and A' illustrate the Examiner's opinion regarding "the steam loss in the steam piping equipped with the steam trap".

In the Examiner's opinion, only the steam leakage amounts Qt, Qt' in the steam trap (i.e., the steam leakage amount Qt due to trap defect and the steam leakage amount Qt' due to trap model) are considered as all of the steam loss existing due to various causes in the steam piping (total unknown steam amount Qx).

In addition, from among the steam leakage amounts Qt, Qt' in the steam trap, the steam leakage amount Qt due to trap defect is considered as improvable steam loss amount, while the steam leakage amount Qt' due to trap model is considered as non-improvable steam loss.

The Fujiwara Publication '716 describes that the steam leakage amount in the steam trap is measured, and that both the steam leakage amount Qt due to trap defect and the steam leakage amount Qt' due to trap model are present.

However, the Fujiwara Publication '716 does not pay attention to the total receiving steam amount Qi and the total necessary steam amount Qo at all, nor to the steam condensation generated in the steam piping at all.

Therefore, the present invention should not be rejected over the Fujiwara Publication '716.

The attached diagrams in Figs. B and B' schematically illustrate the gist of the present invention directed to "the steam piping equipped with the steam trap".

It should be noted that Figs. A' and B' are redrawn from Figs. A and B, respectively, in accordance with the Examiner's opinion that "The steam trap corresponds to the steam-using device".

It should be noted that, in the case of the steam leakage amount Qt' due to trap model, the amount may by reduced be replacing the steam trap with the steam trap of another model.
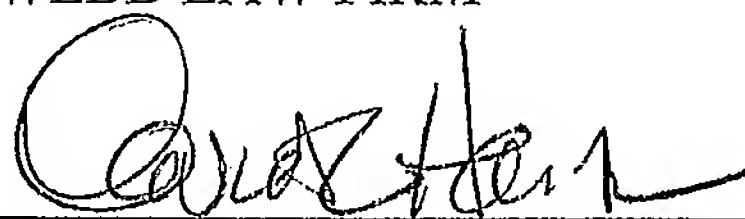
The Examiner acknowledges that the Fujiwara Publication '716 fails to specify the ratios set forth in the claims, namely, Kts, Kx, Kxx, and Kxx', but asserts that the calculations of the ratios is a matter of simple mathematics. This is beside the point. There is no suggestion in the prior art that these ratios are useful to the evaluation of a steam piping system and the justification for replacing steam traps.

In view of the foregoing remarks and amendments, it is urged that this application is now in condition for allowance. Please enter the amendments for purpose of appeal.

Respectfully submitted,

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